

Lewis Mitchell

Curriculum Vitae

August 2021

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Employment

- 2021– **Associate Professor in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.
Deputy Head of School, School of Mathematical Sciences, University of Adelaide.
- 2019–2020 **Senior Lecturer in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.
- 2014–2018 **Lecturer in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.
- 2011–2014 **Ed Lorenz postdoctoral research fellow in the mathematics of climate**, Computational Story Lab,
Vermont Complex Systems Center, University of Vermont, USA.

Education

- 2012 PhD in Applied Mathematics University of Sydney
- 2007 BMath (Adv) (Hons) / BSc (Phys) University of Wollongong

Honours and awards

- 2021 **JH Michell Medal** for outstanding new researchers, ANZIAM.
- 2018 Australian Institute of Policy & Science **Young Tall Poppy Science Award**.
- 2018 ACEMS Outstanding Achievements Recognition Award.
- 2018 ACEMS Recognition for Outstanding Participation in Outreach Award.
- 2017 Faculty of ECMS Excellence in Teaching Award.
- 2010 TM Cherry Prize for best student talk, ANZIAM '10.
- 2007 University Medal, University of Wollongong.

Invited talks

- Invited public lecture, *(Mis)(Dis)information, online social networks, and mathematics*, ACEMS Public Lecture Series, June 2021. [[youtube](#)]
- Invited speaker, *(Mis)Information flow in online social networks*, RMIT mathematics seminar, QMNET seminar, Information & Influence seminar, May-July 2021. [[youtube](#)]
- Invited speaker, *Social media and COVID-19*, Macquarie University mathematics seminar, University of Queensland pandemic seminar, June 2020.
- Keynote speaker, *Characterising information and happiness in online social activity*, 15th Annual Workshop of the Australasian Language Technology Association (ALTA '17), Brisbane QLD, December 2017.
- Invited speaker, *Studying human dynamics via social media (and more)*, St. Mark's College, Adelaide SA, September 2016.
- Invited speaker, *Happiness and the shapes of stories*, South Australian statistical society, Adelaide SA, May 2016.
- Invited speaker, *Information flows and their role in social predictability*, IEEE workshop on complex systems, Perth WA, October 2015.
- Invited speaker, *Hedonometers, Lexicocalorimeters, and more*, University of South Australia mathematics colloquium, July 2015.
- Invited speaker, *Shadowing inflation in ensemble data assimilation*, Nansen environmental and remote sensing centre (NERSC), Bergen, Norway, June 2015.
- Invited speaker, *Happiness, Geography, the Weather and Twitter: Using Data Science as a Microscope for Human Dynamics*, Johnson State College Science Speaker Series, Johnson VT, September 2013.
- Invited speaker, *Improving climate models using non-global data assimilation and parameter estimation*, MAA MathFest, Hartford CT, August 2013.
- Invited speaker, *Big Happy: Revealing the character of cities through data*, TEDx conference, Burlington VT, October 2012. [[youtube](#)]

Grants

Since 2015 I have been awarded over \$3.6 million in externally-funded research grants, \$1.8 million as lead investigator. In 2021 I was also appointed as a (replacement) Chief Investigator for the [ARC Centre of Excellence for Mathematical and Statistical Frontiers \(ACEMS\)](#).

2021–23	L Mitchell, JP Bagrow, M Roughan. "Mathematical modelling of information flow in social networks". <i>ARC Discovery Project DP210103700</i> .	\$390,000
2021–23	M Gillam, L Kelly, L Mitchell, R Lim, T Stanford. "Improving the safety of implantable medical devices". <i>NHMRC Ideas Grant 2002589</i> .	\$775,923
2021	T Graham, L Mitchell, R Ackland. "Grey Zone Theories and Models: Advanced Methods for Detecting and Countering Disinformation". <i>DST ORNet grant</i> .	\$100,000
2021	Y Kashima, R Ackland, L Mitchell, L Falzon, A Filinkov, D Kernot. "Grey Zone Theories and Models: Societal threats, psychosocial security, and collective information processing". <i>DST ORNet grant</i> .	\$100,000
2020–21	L Mitchell, N Geard. "COVID-19 Risk Mapping for State Government". <i>DST Multi-Party Collaborative Project Agreement 9930</i> .	\$28,148
2020–21	L Mitchell, F Neumann, M Nasim, D Weber, C Grimme, H Trautmann, D Assenmacher. "Detection and classification of malicious virtual grassroots influence campaigns in social media". <i>Universities Australia-DAAD (Germany) Australia-Germany Joint Research Cooperation Scheme</i> .	\$24,000
2020	L Mitchell. "Cyber-social-security during COVID-19: The social media reaction to COVIDSafe". <i>Cyber Security CRC</i> .	\$10,000
2019–2022	P Cassey, L Mitchell, R Brewer, J Facelli, P Caley. "Biosecurity surveillance of e-commerce and other online platforms for illegal trade in plants with potential for weed incursion and spread". <i>Centre for Invasive Species Solutions</i> .	\$349,782
2019–2020	L Mitchell, D Stephens. "Modelling in the grey zone". <i>DST Group, University of Adelaide</i> .	\$175,000
2018–2021	P Cassey, JV Ross, L Mitchell, J Austin, J Tyler, P Caley, D Ramsey, L Andrews, R Johnson. "Understanding and intervening in illegal trade in non-native species". <i>Centre for Invasive Species Solutions</i> .	\$665,000
2015–2019	L Mitchell, J Tuke, NG Bean. "Predicting civil unrest and election outcomes using Bayesian network models". <i>Data to Decisions CRC</i> .	\$661,261
2015–2019	L Mitchell, JV Ross, NG Bean. "Predicting common and novel disease outbreaks by assimilating open data into epidemiological models". <i>Data to Decisions CRC</i> .	\$637,606

Teaching

- I won a **Faculty of ECMS Excellence in Teaching Award** for my lecturing in 2017.
- My student evaluations (SELTs) are consistently extremely high; I have been well **above the School, Faculty, and University averages for every question in every semester I have taught**.
- Program Coordinator, University of Adelaide online [Master of Data Science \(Applied\)](#) (2019-20), and Course Coordinator, Mathematical Foundations of Data Science (online).
- Course designer and instructor for two online MOOCs through the EdX platform: [Computational Thinking and Big Data](#), and [Big Data Analytics](#) (launched 2017). As of April 2018, these courses have a combined enrolment of over 40,000 learners.

Course coordination

2021	Optimisation III	60 students
2021	Advanced Mathematical Perspectives II	19 students
2019-21	Mathematical Foundations of Data Science (inc. online)	70 students
2019	Mathematics for Data Science I	185 students
2018-19	Applied Probability III	35 students
2016-17	Numerical Methods II	220-250 students
2015-17	Differential Equations II	120-150 students
2012-14	Calculus I (Uni. Vermont)	30 students

Lecturing

2015	Numerical Methods II	240 students
2014	Mathematics IA	400 students

Supervision

Research staff

1. Dr Anna Kalenkova, Postdoctoral research fellow on ARC DP210103700 *Mathematical modelling of information flow in social networks*, 2021—
2. Dr Oliver Stringham, Postdoctoral research fellow on CISS project *Understanding and intervening in illegal trade in non-native species*, 2018—
3. Dr Mehwish Nasim, Postdoctoral research fellow on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2017-19. Now data scientist at Data61.
4. Dr Robert Cope, Postdoctoral research fellow on D2D CRC project *Predicting common and novel disease outbreaks by assimilating open data into epidemiological models*, 2016-19. Now lecturer at ANU.
5. Ms Saranzaya (Saka) Magsarjav, Research assistant on D2D CRC/DST Group projects, 2019. Now PhD at University of Adelaide.
6. Mr Andrew Nguyen, Research engineer on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2017-19. Now software engineer with Sintelix.
7. Dr Ahmad Hosny, Postdoctoral research fellow on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2015-17. Now senior data scientist with Algorithma.

PhD

1. Ms Saranzaya (Saka) Magsarjav, *Large-scale social media sentiment analysis as a predictor of public behaviour in Australia*, 2021—
2. Mr Curtis Murray, *Understanding patient experiences in healthcare through natural language processing*, 2020—
3. Mr Adam Toomes (School of Biological Sciences, Faculty of Science), *Analysing Dynamics of the Illegal Wildlife Trade in Australia*, 2018—
4. Dr Dennis Liu, *Early Warning Signals: The Interaction of Social Media With Vaccination and Disease Outbreak*, D2D CRC National Security Big Data top-up scholarship (\$30,000 p/a), 2017-21. Now data scientist at Hatch.
5. Dr Caitlin Gray, *Modelling Information Cascades: Creating Predictive Models on Temporal Networks*, D2D CRC National Security Big Data top-up scholarship (\$30,000 p/a), 2017-20. Now data scientist at Amazon.
6. Mr Max Glonek, *A Census of Social Media Users: Statistical Techniques for Quantifying and Correcting Biases in Big Open Data Sources*, 2016—
7. Dr Peter Mathews, *Trend Detection from Social Media Using Probabilistic Graphical Models*, 2016-18. Now senior data scientist at Salesforce.

MPhil

1. Ms Bridget Smart, *An analysis of influence in online social networks*, 2021—
2. Mr Joshua Watt, *Finding and modelling political Echo Chambers online*, 2021—
3. Mr Nicholas Bridges, *Influence of friends and ranking algorithms in social predictability*, 2020—
4. Mr Scott Carnie-Bronca, *Mathematics for last-mile transportation*, 2020—
5. Mr Joshua Price, *Optimising battery replacement in a fleet of scooters*, 2020—
6. Mr Benjamin Nagy (School of Classics, Faculty of Arts), *Carmen et Standard Error: Computational Methods for Stylistics in Latin Poetry*, 2019—
7. Ms Rose Crocker, *Using Data Assimilation and Lagrangian Coherent Structure Techniques to Improve Error Quantification in Geophysical and Climate Models*, 2019-21.
8. Mr Tobin South, *Information Propagation and Community Structure in Social Networks*, 2019—
9. Ms Ashley Dennis-Henderson, *Analysis of World War I Diaries Using Natural Language Processing*, 2018-20. Now PhD at University of Adelaide.
10. Mr Anton Andreacchio, *Applications of Complex Network Analysis for Strategic Decision Making in Australian Rules Football*, 2018— (part time)
11. Ms Jessica Penfold, *Exploring the Link Between Weather Factors and Influenza Dynamics*, 2017-18. Now full-time at DST Group.
12. Ms Michelle Edwards, *Temporal Analysis of Social Networks in Television Series*, 2017-19. Now full-time at Australian Bureau of Statistics.
13. Ms Vanessa Glenny, *A methodology for predictive topic modelling*, 2016-18. Now full-time with Australian Department of Defence.

Honours

1. Mr Luke Pickering, *Novel clustering approaches for popular movies*, Hons I, 2017-19. Now data scientist with Sweat.
2. Ms Saranzaya (Saka) Magsarjav, *Analysis of signed networks in movies*, Hons I, 2018.
3. Mr Declan Jamieson, *Social network analysis of sports supporters: A case study of #BB07*, Hons II, 2018.
4. Ms Caitlin Gray, *Information cascades on random networks*, Hons I, 2016. Continued to PhD with me.
5. Ms Yiwen (Wendy) Li, *Prediction of civil unrest events using Poisson and Hawkes models*, Hons II, 2016. Now data scientist at UoA Waite campus.

Summer research scholarships

- 2020/21 Bridget Smart ([AMSI vacation scholar](#), best AMSIConnect presentation award)
Niamh Jones
- 2019/20 Adam Toomes (APR.Intern with DST)
- 2018/19 Isabelle Greco
John Davey ([AMSI vacation scholar](#))
Ryan Wood
Tobin South
- 2017/18 Tobin South ([AMSI vacation scholar](#), best AMSIConnect presentation award)
Saka Magsarjav
Joshua Dent
- 2016/17 Jessica Penfold ([AMSI vacation scholar](#))
Rose Crocker
Michael Ucci
Tobin South
- 2015/16 Michelle Edwards
Amelia Briggs
James Walker

Professional service & outreach

- Deputy Head of the School of Mathematical Sciences, 2021—.
- Research and design for [The Hedonometer](#) and [Connect For](#) exhibits, [HEDONISM](#) exhibition, Museum of Discovery (MOD), Adelaide, May-Nov 2019.
- CHOOSEMATHS female high school student mentor, Australian Mathematical Sciences Institute (AMSI), 2017-19.
- Outreach committee, School of Mathematical Sciences, University of Adelaide, 2017-19.
- SACE board exam setting committee, 2017-18.
- School colloquium organiser, School of Mathematical Sciences, University of Adelaide, 2016.
- University of Adelaide Open Day organiser 2017-19, volunteer 2015-20. Volunteer presenter for *aMATHing Day*, *Ingenuity*, *MathsCraft* events, 2015-19. Designed outreach activity “How to be a data scientist: Shapes of movies through math” used in *Young Women in Technology* workshops 2015-16.
- Regular media interviews and comment for radio, news articles, podcasts (see *Selected media coverage* below), and write articles for blogs and online outlets such as *The Conversation* (see *Popular articles*), one of which was **published in *The Conversation’s* book of the top 50 articles of 2017.**
- PhD thesis examiner, 2018; MPhil thesis examiner, 2017.
- Invited reviewer for *Nature Communications*, *PLoS ONE*, *SIAM Journal on Applied Dynamical Systems*, *Journal of Complex Networks*, *Journal of the Atmospheric Sciences*, *Monthly Weather Review*, *Chaos*, *Psychological Reports*, *Nonprofit and Voluntary Sector Quarterly*, *International Journal of Geographical Information Science*, *Social Science and Medicine*, *BioMed Research International*, *Online Social Networks and Media*.

Workshops and sessions organised

- *The 4th annual Australian Social Network Analysis Conference* ([ASNAC 2019](#)). Organising and presentation selection committee member, Adelaide, South Australia, November 27-28 2019.
- *Predictability in Earth system processes*. [IMA hot topics workshop](#), Minneapolis MN, November 18-21 2013.
- *Data assimilation and dynamical processes: Ocean, atmosphere and climate*. SIAM conference on mathematical and computational issues in the geosciences, Padova, Italy, April 2013.
- *Computational social science: An exploration of human dynamics*. SIAM conference on dynamical systems, Snowbird UT, May 2013.
- *Challenges in data assimilation and the mathematics of planet Earth and its climate*. Joint Mathematics Meetings 2013, San Diego CA, January 2013.

- *Data assimilation in large-scale weather and climate models*. SIAM conference on uncertainty quantification, Raleigh NC, April 2012.

Publications

Book chapters

1. Mitchell, L (2017b). "How the internet knows if you're happy or sad". In: *The Conversation Yearbook 2017: 50 stand-out articles from Australia's top thinkers*. Melbourne: Melbourne University Press.

Refereed research papers

1. Gallagher, RJ, MR Frank, L Mitchell, AJ Schwartz, AJ Reagan, CM Danforth, and PS Dodds (2021). Generalized word shift graphs: A method for visualizing and explaining pairwise comparisons between texts. *EPJ Data Science* **10**, 4.
2. Ganesan, A, D Dharmapran, E Jenkins, M Aguilar, JX Quah, A Lahiri, K Tiver, L Mitchell, P Kuklik, C Meyer, et al. (2021). M/M/Infinity birth-death processes-a quantitative representational framework to summarize and explain phase singularity and wavelet dynamics in atrial fibrillation. *Frontiers in Physiology* **11**, 616866.
3. Garrett, PM, JP White, S Lewandowsky, Y Kashima, A Perfors, DR Little, N Geard, L Mitchell, M Tomko, and S Dennis (2021). The acceptability and uptake of smartphone tracking for COVID-19 in Australia. *Plos one* **16**(1), e0244827.
4. Stringham, O, PG Diaz, A Toomes, L Mitchell, J Ross, and P Cassey (2021). Live reptile smuggling is predicted by trends in the legal exotic pet trade. *Conservation Letters*.
5. Stringham, OC, S Moncayo, KG Hill, A Toomes, L Mitchell, JV Ross, and P Cassey (2021). Text classification to streamline online wildlife trade analyses. *PloS one* **16**(7), e0254007.
6. Zachreson, C, L Mitchell, M Lydeamore, N Rebuli, M Tomko, and N Geard (2021). Risk mapping for COVID-19 outbreaks using mobility data. *Journal of the Royal Society Interface* **18**, 20200657.
7. Gray, C, L Mitchell, and M Roughan (2020). Bayesian inference of network structure from information cascades. *IEEE Transactions on Signal and Information Processing over Networks* **6**, 371–381.
8. Hossny, AH, L Mitchell, N Lothian, and G Osborne (2020). Feature selection methods for event detection in Twitter: A text mining approach. *Social Network Analysis and Mining* **10**(1), 1–15.
9. Liu, D, L Mitchell, RC Cope, SJ Carlson, and JV Ross (2020). Elucidating user behaviours in a digital health surveillance system to correct prevalence estimates. *Epidemics* **33**, 100404.
10. Pond, T, S Magsarjav, T South, L Mitchell, and JP Bagrow (2020). Complex contagion features without social reinforcement in a model of social information flow. *Entropy* **22**(3), 265.
11. Roughan, M, L Mitchell, and T South (2020a). How the Avengers assemble: Ecological modelling of effective cast sizes for movies. *PLOS ONE* **15**(2), e0223833.
12. South, T, M Roughan, and L Mitchell (2020). Popularity and centrality in Spotify networks: critical transitions in eigenvector centrality. *Journal of Complex Networks* **8**(6), cnaa050.
13. Toomes, A, OC Stringham, L Mitchell, JV Ross, and P Cassey (2020). Australia's wish list of exotic pets: biosecurity and conservation implications of desired alien and illegal pet species. *NeoBiota* **60**, 43.
14. Tuke, J, A Nguyen, M Nasim, D Mellor, A Wickramasinghe, N Bean, and L Mitchell (2020). Pachinko Prediction: A Bayesian method for event prediction from social media data. *Information Processing & Management* **57**(2), 102147. arXiv: [1809.08427](https://arxiv.org/abs/1809.08427).
15. Bagrow, JP, X Liu, and L Mitchell (2019). Information flow reveals prediction limits in online social activity. *Nature Human Behaviour* **3**(2), 122–128. arXiv: [1708.04575](https://arxiv.org/abs/1708.04575).
16. Dharmapran, D, M Schopp, P Kuklik, D Chapman, A Lahiri, L Dykes, F Xiong, M Aguilar, B Strauss, L Mitchell, et al. (2019). Renewal theory provides a universal quantitative framework to characterise the continuous regeneration of rotational events in cardiac fibrillation. *Circulation: Arrhythmia and Electrophysiology* **12** (12), e007569.
17. Glonek, M, J Tuke, L Mitchell, and N Bean (2019). Semi-supervised graph labelling reveals increasing partisanship in the United States Congress. *Applied Network Science* **4**(1), 62.
18. Gray, C, L Mitchell, and M Roughan (2019). Generating Connected Random Graphs. *Journal of Complex Networks*, cnz011. arXiv: [1806.11276](https://arxiv.org/abs/1806.11276).
19. Bagrow, JP and L Mitchell (2018). The quoter model: A paradigmatic model of the social flow of written information. *Chaos* **28**, 075304. arXiv: [1711.00326](https://arxiv.org/abs/1711.00326).
20. Belsky, T and L Mitchell (2018). A shadowing-based inflation scheme for ensemble data assimilation. *Physica D* **380-1**, 1–7. arXiv: [1805.07011](https://arxiv.org/abs/1805.07011).

21. Cope, RC, JV Ross, M Chilver, NP Stocks, and L Mitchell (2018). Characterising seasonal influenza epidemiology using primary care surveillance data. *PLOS computational biology* **14**(8), e1006377.
22. Hosny, AH, T Moschuo, G Osborne, L Mitchell, and N Lothian (2018). Enhancing keyword correlation for event detection in social networks using SVD and k-means: Twitter case study. *Social Network Analysis and Mining* **8**(1), 49.
23. Tiggemann, M, O Churches, L Mitchell, and Z Brown (2018). Tweeting weight loss: A comparison of #thinspiration and #fitspiration communities on Twitter. *Body Image* **25**, 133–138.
24. Venohr, M, SD Langhans, O Peters, F Hölker, R Arlinghaus, L Mitchell, and C Wolter (2018). The underestimated dynamics and impacts of water-based recreational activities on freshwater ecosystems. *Environmental reviews* **26** (2), 199–213.
25. Alajajian, SE, JR Williams, AJ Reagan, SC Alajajian, MR Frank, L Mitchell, J Lahne, CM Danforth, and PS Dodds (2017). The lexicatorimeter: Gauging public health through caloric input and output on social media. *PLOS ONE* **12**(2), e0168893.
26. Dodds, PS, DR Dewhurst, FF Hazlehurst, CM Van Oort, L Mitchell, AJ Reagan, JR Williams, and CM Danforth (2017). Simon's fundamental rich-get-richer model entails a dominant first-mover advantage. *Physical Review E* **95**(5), 052301.
27. Dodds, P, L Mitchell, A Reagan, and C Danforth (2016). Tracking climate change through the spatiotemporal dynamics of the Teletherms, the statistically hottest and coldest days of the year. *PLOS ONE* **11**(5), e0154184.
28. Kiley, DP, AJ Reagan, L Mitchell, CM Danforth, and PS Dodds (2016). Game story space of professional sports: Australian rules football. *Physical Review E* **93**(5), 052314.
29. Mitchell, L and JV Ross (2016). A data-driven model for influenza transmission incorporating media effects. *Royal Society Open Science* **3**, 160481.
30. Reagan, AJ, L Mitchell, D Kiley, CM Danforth, and PS Dodds (2016). The emotional arcs of stories are dominated by six basic shapes. *EPJ Data Science* **5**(1), 31.
31. Cody, EM, AJ Reagan, L Mitchell, PS Dodds, and CM Danforth (2015). Climate change Sentiment on Twitter: An unsolicited public opinion poll. *PLOS ONE* **10**(8), e0136092.
32. Dodds, PS, EM Clark, S Desu, MR Frank, AJ Reagan, JR Williams, L Mitchell, KD Harris, IM Kloumann, JP Bagrow, K Megerdumian, MT McMahon, BF Tivnan, and CM Danforth (2015). Common mistakes in measuring frequency-dependent word characteristics. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* **112**(23), E2984–E2985.
33. Dodds, PS, EM Clark, S Desu, MR Frank, AJ Reagan, JR Williams, L Mitchell, KD Harris, IM Kloumann, JP Bagrow, K Megerdumian, MT McMahon, BF Tivnan, and CM Danforth (2015). Human language reveals a universal positivity bias. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* **112**(8), 2389–2394.
34. Mitchell, L and A Carrassi (2015). Accounting for model error due to unresolved scales within ensemble Kalman filtering. *Quarterly Journal of the Royal Meteorological Society* **141**(689), 1417–1428. arXiv: [1409.0589](https://arxiv.org/abs/1409.0589).
35. Belsky, T, J Berwald, and L Mitchell (2014). Nonglobal parameter estimation using local ensemble Kalman filtering. *Monthly Weather Review* **142**(6), 2150–2164.
36. Frank, MR, L Mitchell, PS Dodds, and CM Danforth (2014). Standing swells surveyed showing surprisingly stable solutions for the Lorenz '96 model. *International Journal of Bifurcation and Chaos* **24**(10), 1430027.
37. Frank, MR, L Mitchell, PS Dodds, and CM Danforth (2013). Happiness and the patterns of life: A study of geolocated tweets. *Scientific Reports* **3**, 1–9.
38. Mitchell, L, MR Frank, KD Harris, PS Dodds, and CM Danforth (2013). The geography of happiness: Connecting Twitter sentiment and expression, demographics, and objective characteristics of place. *PLOS ONE* **8**(5), e64417.
39. Mitchell, L and GA Gottwald (2012a). Controlling model error of underdamped forecast models in sparse observational networks using a variance-limiting Kalman filter. *Quarterly Journal of the Royal Meteorological Society* **139**(670), 212–225.
40. Mitchell, L and GA Gottwald (2012b). Data assimilation in slow-fast systems using homogenized climate models. *Journal of the Atmospheric Sciences* **69**(4), 1359–1377.
41. Mitchell, L and GA Gottwald (2012c). On finite-size Lyapunov exponents in multiscale systems. *Chaos* **22**(023115).
42. Gottwald, GA, L Mitchell, and S Reich (2011). Controlling overestimation of error covariance in ensemble Kalman filters with sparse observations: A variance-limiting Kalman filter. *Monthly Weather Review* **139**(8), 2650–2667.
43. Zhu, S-P and L Mitchell (2011). Combined diffraction and radiation of ocean waves around an OWC device. *Journal of Applied Mathematics and Computing* **36**(1-2), 401–416.
44. Zhu, S-P and L Mitchell (2009). Diffraction of ocean waves around a hollow cylindrical shell structure. *Wave Motion* **46**(1), 78–88.

Papers in refereed conference proceedings

1. Murray, C, L Mitchell, J Tuke, and M Mackay (2021). Symptom extraction from the narratives of personal experiences with COVID-19 on Reddit. In: *MAISoN Workshop Proceedings of the 15th International AAAI Conference on Web and Social Media (ICWSM)*. arXiv: [2005.10454](#).
2. Dennis-Henderson, A, M Roughan, L Mitchell, and J Tuke (2020). Life still goes on: Analysing Australian WW1 Diaries through Distant Reading. In: *Proceedings of the The 4th Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*, pp.90–104.
3. Edwards, M, L Mitchell, J Tuke, and M Roughan (2020). The one comparing narrative social network extraction techniques. In: *Proceedings of the 2020 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM '20)*, pp.905–14. arXiv: [1811.01467](#).
4. Weber, D, M Nasim, L Falzon, and L Mitchell (2020). #ArsonEmergency and Australia's "Black Summer": Polarisation and misinformation on social media. In: *Proceedings of the 2nd Multidisciplinary International Symposium on Disinformation in Open Online Media (MISDOOM '20)*. arXiv: [2004.00742](#).
5. Weber, D, M Nasim, L Mitchell, and L Falzon (2020). A method to evaluate the reliability of social media data for social network analysis. In: *2020 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM '20)*. IEEE, pp.317–321.
6. Glenny, V, J Tuke, N Bean, and L Mitchell (2019). A framework for streamlined statistical prediction using topic models. In: *Proceedings of the 2019 Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature (LaTeCH-CLFL '19)*. arXiv: [1904.06941](#).
7. Hossny, AH and L Mitchell (2019). Event detection in Twitter: A keyword volume approach. In: *The 2nd International Workshop on Social Computing (IWSC '18)*. arXiv: [1901.00570](#).
8. Nguyen, A, T South, N Bean, J Tuke, and L Mitchell (2019). Podlab at SemEval-2019 Task 3: The Importance of Being Shallow. In: *Proceedings of the 13th International Workshop on Semantic Evaluation*, pp.292–296.
9. Glonek, M, J Tuke, L Mitchell, and N Bean (2018). GLaSS: Semi-supervised Graph Labelling with Markov Random Walks to Absorption. In: *Complex Networks and Their Applications*. Ed. by LM Aiello, C Cherifi, H Cherifi, R Lambiotte, P Lió, and LM Rocha. Vol. 7. Cambridge: Springer International Publishing, pp.304–315.
10. Gray, C, L Mitchell, and M Roughan (2018). Super-blockers and the effect of network structure on information cascades. In: *Proceedings of the 26th International Conference on the World Wide Web (WWW '18) Companion*, pp.1435–1441. arXiv: [1802.05039](#).
11. Mathews, P, C Gray, L Mitchell, GT Nguyen, and NG Bean (2018). SMERC: Social media event response clustering using textual and temporal information. In: *Proceedings of the 2018 International Workshop on Big Social Media Data Management and Analysis (BSMDMA2018)*.
12. Mitchell, L, J Dent, and JV Ross (2018). Mo' characters mo' problems: Online social media platform constraints and modes of communication. In: *The 19th annual conference of the Association of Internet Researches (AOIR '18)*. Montreal.
13. Nasim, M, A Nguyen, N Lothian, R Cope, and L Mitchell (2018). Real-time detection of content polluters in partially observable Twitter networks. In: *Proceedings of the 26th International Conference on the World Wide Web (WWW '18) Companion*, pp.1331–1339. arXiv: [1804.01235](#).
14. Bagrow, JP, CM Danforth, and L Mitchell (2017). Which friends are more popular than you? Contact strength and the friendship paradox in social networks. In: *The 2017 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM '17)*. Sydney, pp.103–108. arXiv: [1703.06361](#).
15. Mathews, P, L Mitchell, G Nguyen, and N Bean (2017). The nature and origin of heavy tails in retweet activity. In: *The 26th International Conference on World Wide Web Companion*, pp.1493–1498. arXiv: [1703.05545](#).
16. Mitchell, L and S-P Zhu (2008). Linear Diffraction and Radiation of Surface Waves by a Hollow Suspended Cylindrical Shell. In: *Proceedings of the ASME 27th International Conference on Offshore Mechanics and Arctic Engineering (OMAE '08)*, pp.579–585.

Working papers

1. Frank, MR, JR Williams, L Mitchell, JP Bagrow, PS Dodds, and CM Danforth (2015). Constructing a taxonomy of fine-grained human movement and activity motifs through social media. arXiv: [1410.1393](#).
2. Bagrow, JP, S Desu, MR Frank, N Manukyan, L Mitchell, A Reagan, EE Bloedorn, LB Booker, LK Branting, MJ Smith, BF Tivnan, CM Danforth, PS Dodds, and JC Bongard (2013). Shadow networks: Discovering hidden nodes with models of information flow. arXiv: [1312.6122](#).

Popular articles

1. Black, A, D Liu, and L Mitchell (2020). How to flatten the curve of coronavirus, a mathematician explains. In: *The Conversation* (170K reads). <https://theconversation.com/how-to-flatten-the-curve-of-coronavirus-a-mathematician-explains-133514>.
2. Dennis, S, A Perfors, D Little, J White, L Mitchell, N Geard, P Garrett, and S Lewandowsky (2020). 70% of people surveyed said they'd download a coronavirus app. Only 44% did. Why the gap? In: *The Conversation* (30K reads). <https://theconversation.com/70-of-people-surveyed-said-theyd-download-a-coronavirus-app-only-44-did-why-the-gap-138427>.
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